



Report to Chairman, Subcommittee on  
Coast Guard and Maritime  
Transportation, Committee on  
Transportation and Infrastructure,  
House of Representatives

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March 2015

# COAST GUARD AIRCRAFT

Transfer of Fixed-  
Wing C-27J Aircraft Is  
Complex and Further  
Fleet Purchases  
Should Coincide with  
Study Results

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# GAO Highlights

Highlights of [GAO-15-325](#), a report to the Chairman, Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives

## Why GAO Did This Study

The Air Force is transferring 14 C-27J aircraft to the Coast Guard. Once modified into surveillance aircraft, the C-27Js will be a part of the Coast Guard's fixed-wing aircraft fleet. In 2007, the Coast Guard established a baseline of aircraft quantities and costs known as the program of record. This baseline established the cost and quantity of aircraft necessary to achieve its goal of 52,400 flight hours per year. The Coast Guard's aircraft, including the HC-144 and HC-130J/H, are integral to its missions, such as counterdrug and search and rescue.

GAO was asked to review the transfer of the C-27J to the Coast Guard. This report assesses (1) the status of the transfer and risks the Coast Guard faces in fielding the transferred aircraft; and (2) the extent to which acquiring the C-27J affects the overall cost and performance of the Coast Guard's fixed-wing aviation fleet.

GAO analyzed program documents and maintenance records for the C-27J. GAO interviewed Coast Guard and Air Force officials and private contractors. GAO also analyzed the Coast Guard's C-27J business case.

## What GAO Recommends

The Department of Homeland Security (DHS) and the Coast Guard should advise Congress of the time frames for the Coast Guard's fleet analysis and to modify the provision of additional HC-130Js, as appropriate, in the interim. DHS agreed with the first recommendation, but did not agree with the second recommendation. If the Coast Guard accepts additional HC-130Js before completing the fleet mix study, the aircraft may be in excess of the Coast Guard's need.

View [GAO-15-325](#). For more information, contact Michele Mackin at (202) 512-4841 or [mackinm@gao.gov](mailto:mackinm@gao.gov).

March 2015

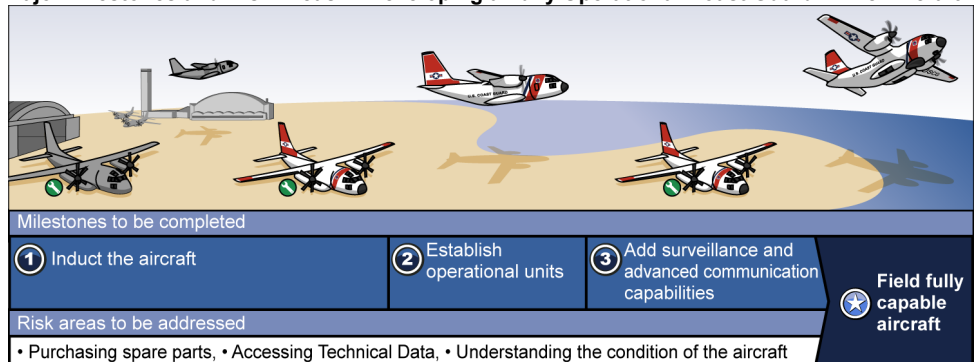
## COAST GUARD AIRCRAFT

### Transfer of Fixed-Wing C-27J Aircraft Is Complex and Further Fleet Purchases Should Coincide with Study Results

#### What GAO Found

As of January 2015, the Coast Guard had transferred 2 of the 14 C-27J aircraft it is receiving from the Air Force to its aircraft maintenance facility, with plans to field 14 fully operational C-27Js by 2022. According to initial Coast Guard estimates, while the aircraft come at no cost, the Coast Guard needs about \$600 million to fully operationalize them. This process is complex and significant work and risk remain. For example, the Coast Guard must establish its needs and purchase a set of spare parts for each aircraft, but faces hurdles due to potential pricing issues and delivery delays from the manufacturer. Also, the Coast Guard does not have access to the manufacturer's technical data that are required for modifications to the aircraft's structure to, for example, incorporate radar. These and other risks may inhibit the Coast Guard's ability to operate the aircraft as planned. However, the Coast Guard is working to mitigate these risks.

#### Major Milestones and Risk Areas in Developing a Fully Operational Coast Guard C-27J Aircraft



Source: GAO presentation of Coast Guard data. | [GAO-15-325](#)

The C-27J will improve the affordability of the Coast Guard's fixed-wing fleet, but the fleet as currently planned may not be optimal in terms of cost and flight hour capability. The Coast Guard submitted a business case to Congress in 2013 that determined the C-27J would save \$837 million over 30 years, compared to the program of record, without reducing fleet performance. GAO estimates that the fleet the Coast Guard is currently pursuing achieves nearly all of these savings. However, the source of these savings has shifted. A significant portion of the savings now results from an 18 percent drop in flight hours due to a change in the mix of aircraft the Coast Guard intends to pursue. GAO used updated information in conducting its analysis, such as the expected service life of each aircraft type. Consistent with congressional direction, the Coast Guard is conducting a multi-phased analysis of its mission needs—including its flight hour goals and fleet of fixed-wing assets—but will not present the full results prior to its 2019 budget request. In the meantime, the Coast Guard has prudently paused its existing HC-144 acquisition program. However, since 2000, the Coast Guard has received 12 HC-130Js without budgeting for them and it may continue to receive these aircraft while it studies its fixed-wing fleet needs. If the Coast Guard continues to receive these aircraft in the near term, the capability and cost of the Coast Guard's fixed-wing fleet runs the risk of being dictated by the assets the Coast Guard already owns rather than what it determines it needs.

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## Abbreviations

|        |                                                    |
|--------|----------------------------------------------------|
| AMARG  | 309th Aerospace Maintenance and Regeneration Group |
| DHS    | Department of Homeland Security                    |
| DOD    | Department of Defense                              |
| USASOC | U.S. Army Special Operations Command               |

|                                                                                                                                                                                                                                                                                                                                                                                                                  |
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March 26, 2015

The Honorable Duncan Hunter  
Chairman  
Subcommittee on Coast Guard and Maritime Transportation  
Committee on Transportation and Infrastructure  
House of Representatives

Dear Mr. Chairman:

Medium and long-range fixed-wing surveillance aircraft are integral to achieving the Coast Guard's missions and maritime surveillance needs. For example, these assets are essential to the Coast Guard's counterdrug, search and rescue, and alien migrant interdiction operations. This fixed-wing fleet is undergoing a transformation as the Coast Guard is in the process of receiving 14 C-27J aircraft from the Air Force—valued at approximately \$500 million—as a result of a congressionally mandated transfer. U.S. Army Special Operations Command (USASOC) also received 7 C-27Js as a part of a separate transfer. The C-27J will be added to the Coast Guard's fixed-wing aircraft fleet, which currently includes HC-144, HC-130J, and HC-130H aircraft. The Coast Guard is working with the Navy to develop improved surveillance capabilities for its fixed-wing fleet, including the C-27J. We have reported extensively on the Coast Guard's challenges in managing its broad multi-billion dollar major acquisition portfolio, intended to acquire capabilities to conduct missions ranging from marine safety to search and rescue.<sup>1</sup> In 2014, we reported that the Coast Guard's portfolio continues to be unaffordable and recommended that the Coast Guard create a 20-year fleet modernization plan that makes trade-offs between acquisition programs to account for projected budgets.<sup>2</sup> The Department of Homeland Security (DHS) agreed with the recommendation, but has not fully implemented it.

GAO was asked to review the transfer of the C-27J aircraft from the Air Force to the Coast Guard. This report assesses (1) the status of the transfer—including establishing a maintenance program, basing the

<sup>1</sup> For our past work on these issues, see related GAO products at the end of this report.

<sup>2</sup> GAO, *Coast Guard Acquisitions: Better Information on Performance and Funding Needed to Address Shortfalls*, [GAO-14-450](#) (Washington, D.C.: June 5, 2014).

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aircraft, cost and schedule estimates, and plans for increasing capability and testing—as well as any risks the Coast Guard faces to field the transferred aircraft; and (2) the extent to which acquiring the C-27Js affects the overall cost and performance of the Coast Guard’s fixed-wing aviation fleet.

To assess the transfer, we reviewed program documents from the Air Force, Army, Navy, DHS, and Coast Guard. Through this assessment, we worked with the Coast Guard to gain an understanding of the key steps in the transfer process. We visited (1) Air Force’s 309th Aerospace Maintenance and Regeneration Group (AMARG), more commonly known as the Air Force “boneyard,” where 13 of the 14 C-27Js have been stored; (2) L-3 Communications Corporation’s Platform Integration Division (L-3 Communications)—which integrated military capabilities on the aircraft and currently owns the 14th aircraft destined for the Coast Guard; (3) Coast Guard’s Aviation Logistics Center; and (4) USASOC’s Pope Airfield. We also visited the North American headquarters of Alenia Aermacchi, which manufactures the C-27J and has knowledge and experience associated with maintaining the aircraft. To determine whether or not there are knowledge gaps or other risks facing the Coast Guard in fielding this asset, we reviewed program and planning documents as well as Air Force and USASOC maintenance and operations records. To assess the total financial benefit to the Coast Guard of receiving the C-27J, we analyzed the Coast Guard’s May 2012 business case analysis and the subsequent analysis it provided to Congress in August 2013. We then compared the 2012 business case analysis with the Coast Guard’s current plans for its fixed-wing aviation fleet. Further, we interviewed officials from the Coast Guard, Army, Air Force, the Defense Contract Management Agency, private contractors, and other stakeholders to determine the status of the transfer and any risks the Coast Guard faces in fielding the C-27J.

We conducted this performance audit from July 2014 to March 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

The history of the C-27J is complex and involves several government agencies and private contractors. To meet the Army's combat zone airlift supply mission, in 2007 a joint Army and Air Force program office awarded a contract for C-27Js to a company called Global Military Aircraft Systems—a partnership between L-3 Communications and the manufacturer, an Italian company called Alenia Aermacchi (a Finmeccanica company). L-3 Communications, the lead partner, installed U.S. military-specific equipment on the aircraft manufactured by Alenia Aermacchi. In addition, a separate division of L-3 Communications provided full logistics support to the Army and Air Force under the Global Military Aircraft Systems contract. The Air Force and Army began purchasing these aircraft without fully developing a logistics plan that established how to fully support the aircraft. Five years later, in 2012, the Air Force canceled the program, citing budget constraints and its determination that Air Force C-130s could provide nearly all of the Army's desired capability. The Air Force had not finished its logistics plan at the time.

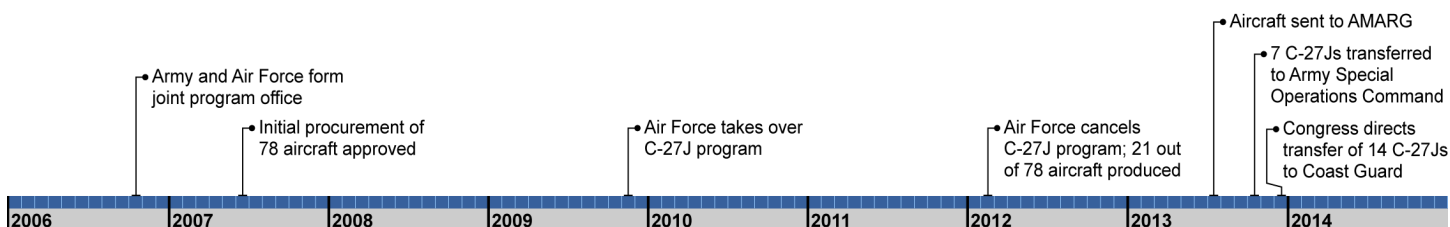
When the program was canceled in 2012, the Department of Defense (DOD) had purchased 21 C-27Js—13 by the Army and 8 by the Air Force. By mid-2013, the 13 aircraft that the Air Force fielded were sent to AMARG (colloquially referred to as the “boneyard”) for preservation and 8 aircraft were still in production.<sup>3</sup> The Air Force announced that these 21 aircraft would be made available to U.S. government agencies. In May 2012, the Coast Guard conducted a business case, which estimated that receiving the 21 C-27J aircraft would save it \$826 million, in fiscal year 2012 dollars, without changing planned performance targets. In August 2013, after USASOC also expressed interest in the aircraft, the Coast Guard wrote a letter to Congress using its prior analysis to estimate that receiving 14 C-27Js, instead of all 21 aircraft, would still save \$799 million (\$837 million in fiscal year 2015 dollars) over 30 years. Figure 1 illustrates the major events in the history of the C-27J.

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<sup>3</sup> The preservation process involves a number of activities, such as: removing all munitions, classified equipment and hazardous material, cleaning the aircraft, and sealing the aircraft with a preservation compound.



**Figure 1: Time Line of the History of the C-27J Aircraft**

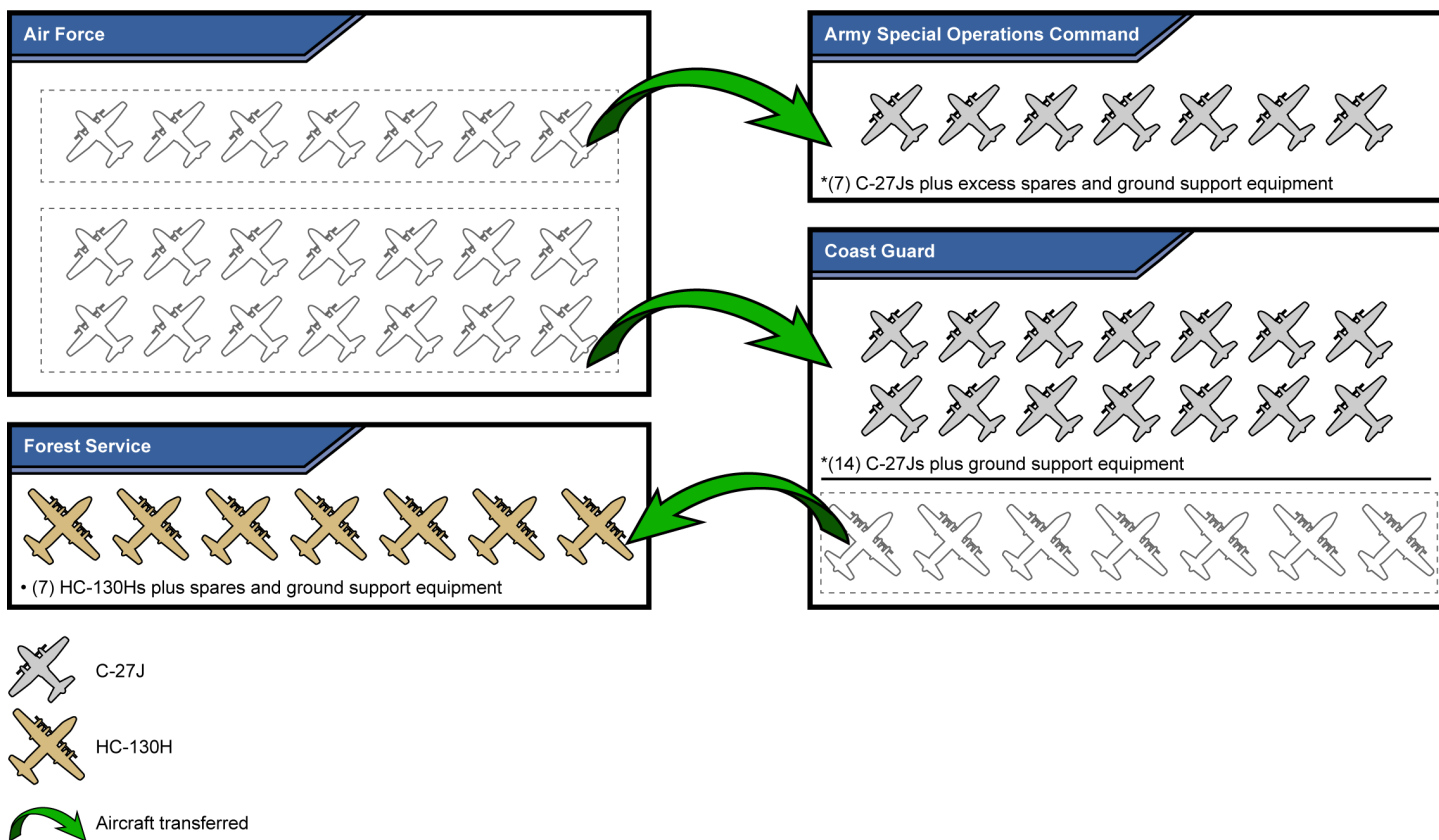


Source: Army, Air Force, and Coast Guard data. | GAO-15-325

In fall 2013, DOD transferred 7 C-27J aircraft to USASOC; 3 that had since completed production and 4 aircraft still in production. Then, in December 2013, as a part of the fiscal year 2014 National Defense Authorization Act, Congress directed DOD to transfer the remaining 14 C-27J aircraft to the Secretary of Homeland Security. These aircraft—13 from AMARG storage and 1 aircraft still owned by L-3 Communications—have been or will be transferred to the Coast Guard. Congress also required Homeland Security to transfer 7 HC-130Hs to the Air Force after certain modifications; the Air Force was required to transfer these aircraft to the Secretary of Agriculture for use by the U.S. Forest Service.<sup>4</sup> These HC-130H aircraft are to be supplied by the Coast Guard. Figure 2 illustrates the transfer of aircraft among these agencies.

<sup>4</sup> Pub. L. No. 113-66 §1098 (2013).

**Figure 2: Aircraft Transfers among the Air Force, U.S. Army Special Operations Command, Coast Guard, and Forest Service**



Source: GAO analysis. | GAO-15-325

## Coast Guard Fixed-Wing Asset Capabilities

The Coast Guard's fixed-wing aviation fleet comprises several assets with different capabilities. Table 1 illustrates the capability differences between the Coast Guard's long-range (HC-130H and HC-130J) and medium-range (HC-144 and C-27J) airframes in terms of payload, range, endurance, and speed. For each asset, table 1 also includes the number of annual planned flight hours, the designed service life, and cost per flight hour.

**Table 1: Capability and Efficiency Characteristics of the Coast Guard's Fixed Wing Aircraft**

| Aircraft | Max payload (pounds) | Max range (nautical miles) | Max endurance (hours) | Max speed (knots) | Planned flight hours per year (per airframe) | Designed service life (years) | Cost per flight hour <sup>a</sup> |
|----------|----------------------|----------------------------|-----------------------|-------------------|----------------------------------------------|-------------------------------|-----------------------------------|
| HC-144   | 9,392                | 2,200                      | 8                     | 236               | 1,000                                        | 40                            | \$3,518                           |
| C-27J    | 25,000               | 3,200                      | 10.3                  | 312               | 1,000                                        | 25                            | 4,544                             |
| HC-130J  | 38,301               | 5,020                      | 21.6                  | 362               | 800                                          | 30                            | 7,092                             |
| HC-130H  | 38,301               | 4,285                      | 13.5                  | 320               | 800                                          | 30                            | 8,355                             |

Source: GAO analysis based on the data in the Coast Guard's May 2012 business case analysis (which informed the Coast Guard's August 2013 letter to Congress), and other Coast Guard data. GAO-15-325

Note: Unshaded rows represent the medium range surveillance aircraft. Shaded rows represent the long range surveillance aircraft.

<sup>a</sup> Cost in fiscal year 2015 dollars. The cost per flight hour represents the variable costs of operating an aircraft, including the fuel cost, spare parts, and wear and tear on the aircraft.

The HC-144 and C-27J have a lower cost per flight hour than the HC-130. Each aircraft is planned to have the same surveillance and communication capabilities, and, according to program officials, the extent to which the endurance, speed, range, and other attributes increase performance largely depends upon the mission the aircraft is performing. For example, all of these aircraft can conduct maritime security and search and rescue missions in accordance with Coast Guard needs; however, the HC-130J, with greater payload and endurance, is better suited for responding to humanitarian disasters or mass casualty incidents either domestically or overseas. The C-27J is larger than the HC-144, but generally fits between the HC-144 and the HC-130J in terms of the capability of the airframe.

## Coast Guard Acquisition Strategy for Fixed-Wing Assets

In 2005, the Coast Guard developed a mission needs statement that factored in new requirements for its fixed-wing assets following the September 11, 2001, terrorist attacks. In particular, this document emphasized the importance of persistent surveillance in accomplishing Coast Guard missions—generated by flying more hours with surveillance-capable aircraft. Based on this analysis, the Coast Guard determined that it needed 52,400 fixed wing flight hours per year to meet its missions while moving toward a presence-based approach to enforcement, rather than its conventional response-based approach. For example, according to the mission needs statement, this presence-based approach will lead to operations that detect and interdict threats as far from the United States as possible. In 2007, based on the 2005 mission needs statement,

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the Coast Guard published a baseline for all of its major acquisition programs, which became a single program of record. The fixed-wing portion of this program of record included 22 HC-130Js and 36 HC-144s, which were planned to meet the annual goal of 52,400 flight hours. The receipt of 14 C-27Js represents a significant change, in terms of fleet composition, to the Coast Guard's 2007 program of record.

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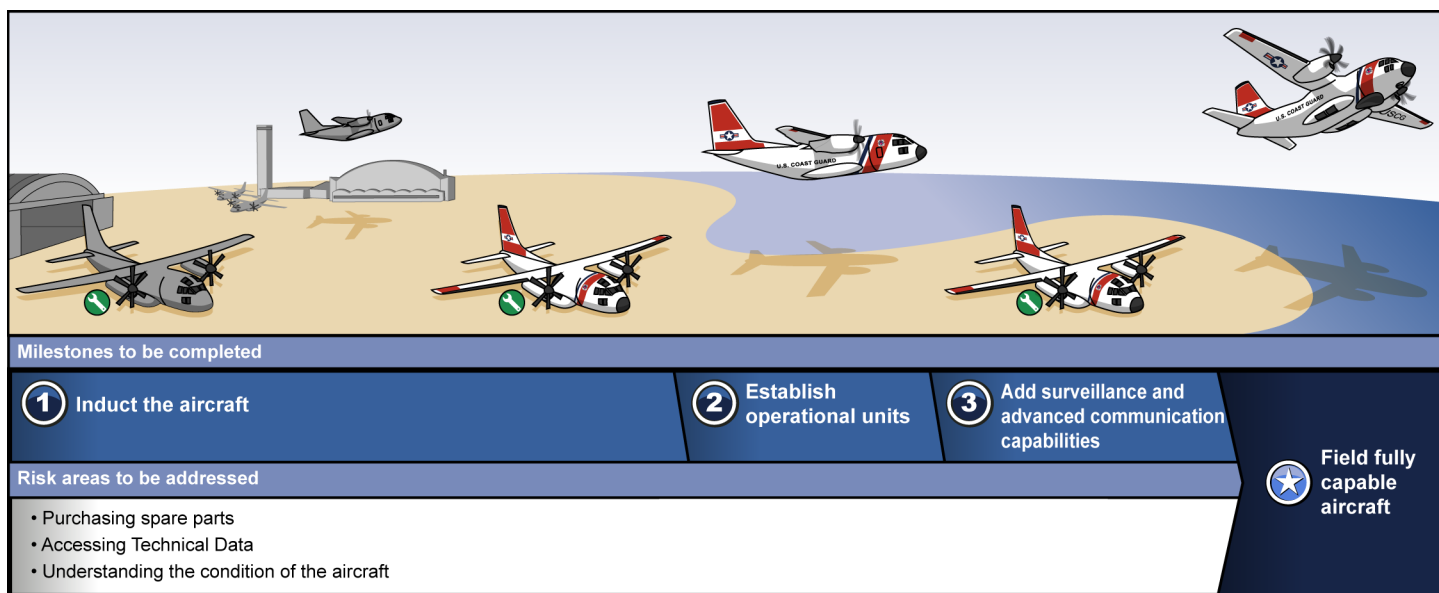
## Significant Work Remains to Field 14 Fully Capable C-27Js

As of January 2015, the Coast Guard has transferred 2 of 14 C-27Js to its aircraft maintenance facility, after returning them to flyable status, and is in the process of developing a detailed plan for fielding all 14 aircraft by 2022.<sup>5</sup> The Coast Guard, based on DHS direction, has restructured its HC-144 acquisition program to also encompass the transfer of the C-27Js. This combined acquisition, termed the Medium Range Surveillance Aircraft program, is considered a new, major program within DHS. The C-27J transfer process is not simple, as significant work remains to achieve three major milestones before the aircraft are fully operational: (1) induct the aircraft (prepare for use), (2) establish operational units (bases), and (3) add surveillance and advanced communication capabilities. In addition, complicating these efforts are areas of risk that need to be addressed before the Coast Guard can field fully operational C-27Js. These three risk areas are: (1) purchasing spare parts, (2) accessing technical data, and (3) understanding the condition of the aircraft. Figure 4 illustrates the milestones and risk areas the Coast Guard must address before it can field a fully capable aircraft.

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<sup>5</sup> The Coast Guard is planning to take the third aircraft out of AMARG storage by spring 2015.

**Figure 3: Major Milestones and Risk Areas in Developing a Fully Operational Coast Guard C-27J Aircraft**



Source: GAO presentation of Coast Guard data. | GAO-15-325

The Coast Guard's 2012 business case estimated that it would cost about \$600 million in acquisition costs to transform the 14 C-27Js into fully functioning Coast Guard assets, which includes purchasing sets of initial spare parts (estimated at \$150 million), flight trainers/maintenance equipment/engineering costs (estimated at \$150 million), and installing surveillance capabilities (estimated at \$300 million). However, these costs are notional since the Coast Guard is in the process of developing a cost, schedule, and performance baseline for the aircraft as part of its Medium Range Surveillance Aircraft program. These costs are based on the Coast Guard's experience with other fixed-wing aircraft and do not account for risks specific to the C-27J. The Coast Guard has awarded or plans to award several contracts to assist with these steps, in some cases partnering with USASOC. Coast Guard project officials recognize each of these risk areas and are confident they can work through them given the Coast Guard's experience with foreign manufactured aircraft, such as the HC-144.<sup>6</sup>

<sup>6</sup> The HC-144 is built by the Airbus Group and is manufactured in Spain.

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## DHS and Coast Guard Are Establishing a Medium Range Surveillance Aircraft Program to Oversee the C-27J Transfer and Modification Process

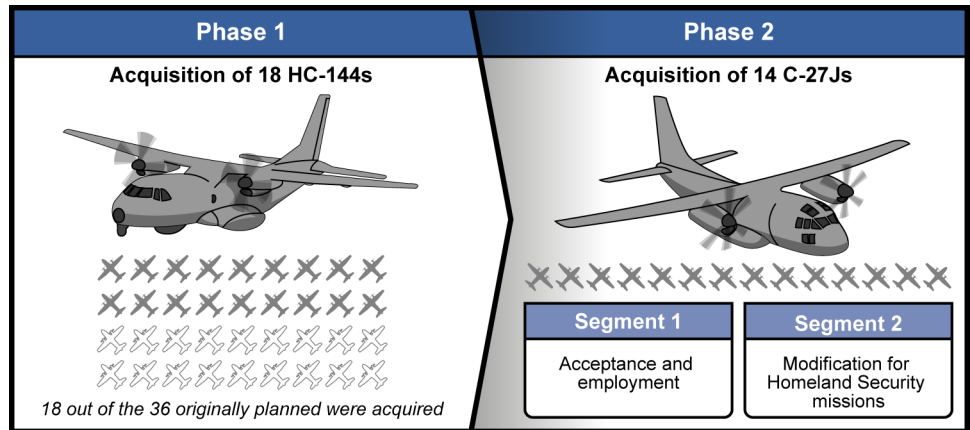
DHS oversees Coast Guard major acquisitions and in October 2014 issued an acquisition decision memorandum that outlined how the C-27J would be incorporated into the DHS acquisition review process. In this regard, DHS directed the Coast Guard to restructure its HC-144 program to accommodate the addition of the 14 C-27J aircraft. These aircraft, together, are now termed the Medium Range Surveillance Aircraft program, which is a major DHS acquisition program.<sup>7</sup> DHS directed the Coast Guard to pursue the Medium Range Surveillance Aircraft program in two phases.

- The first phase is the acquisition of the HC-144, which is currently paused following the purchase of 18 out of 36 planned aircraft. The Coast Guard previously estimated that it would complete the purchase of 36 missionized HC-144s by 2025. DHS has instructed the Coast Guard to develop a plan to close out this phase.
- The second phase focuses on the acquisition of the C-27J aircraft and has two segments.
  - Segment one is the induction and employment of the unmodified C-27J aircraft that can perform missions, but without surveillance capabilities.
  - Segment two is modification of the 14 aircraft, which principally involves the addition of the surveillance and advanced communication capabilities and operationally testing the asset. The Coast Guard was directed to develop all acquisition documents for the second segment of the C-27J acquisition, including a life-cycle cost estimate and acquisition program baseline. DHS further directed the Coast Guard to operationally test a prototype of the C-27J with the new surveillance capabilities before it modifies all 14 aircraft.

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<sup>7</sup> Major acquisitions in DHS have a life cycle cost greater than \$300 million in 2009-year dollars.

**Figure 4: Organization of the Coast Guard's Medium Range Surveillance Aircraft Program**



Source: GAO presentation of Department of Homeland Security data. | GAO-15-325

In the acquisition decision memorandum, DHS directed the Coast Guard to complete a review of the Medium Range Surveillance Aircraft program, which it did in December 2014, to discuss its progress and oversight plans. The Coast Guard's review states that it is developing a baseline for the program and preliminarily estimates that segment one and segment two of the C-27J acquisition will cost approximately \$600 million, as estimated in the 2012 business case. In the President's fiscal year 2016 budget, the Coast Guard is requesting \$102 million for the C-27J program for induction activities and establishing the first operational unit. In addition, the Coast Guard is requesting an additional \$55 million for several Coast Guard-wide infrastructure projects, including a depot maintenance facility for the HC-144 and C-27J.

In February 2015, DHS finalized a second acquisition decision memorandum based upon the Coast Guard's review. In this memorandum, DHS assigned the following seven action items to be complete by various deadlines between April 2015 and January 2016. These seven action items are to be completed by the Coast Guard and provided to DHS:

1. Develop and provide the acquisition program baseline, rough cost estimate, and logistics plan for the first segment of the C-27J phase of this program.

- 
2. Include the funding requirements for the C-27J in the Coast Guard's forthcoming 5-year funding plan (fiscal years 2016 to fiscal years 2020).
  3. Submit a detailed schedule that includes C-27J engineering and testing activities.
  4. Present operational test strategies to DHS's Director of Operational Test and Evaluation for the HC-144 and the C-27J.
  5. Provide a revised execution plan including a summary of funds obligated and a spend plan for the fiscal year 2014 and 2015 C-27J funding.
  6. Provide a business case analysis comparing Coast Guard operational and depot maintenance to contracted maintenance for the C-27J.
  7. Provide a report on the process of adding a mission system to the C-27J.

DHS also provided the Coast Guard with the authority to continue to incorporate the C-27J aircraft into its fleet while it develops these areas of knowledge and provides these action items to DHS.

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### The Coast Guard Has Transferred Two C-27Js and Is Taking Steps to Achieve Major Milestones

Three major milestones need to be accomplished before the Coast Guard can field fully capable C-27Js:

1. **Induct the aircraft**—The Coast Guard plans to continue removing the aircraft from storage, establish a maintenance regimen, recondition the aircraft, and develop manuals and user guides, among other tasks. Currently, the Coast Guard is assessing the first two planes and establishing the key steps necessary to finish inducting these aircraft.
2. **Establish operational units**—The Coast Guard plans to establish the first C-27J operational unit (base) in California in fiscal year 2016 and a second unit at an as-yet undetermined location in fiscal year 2018. Training aircrew, among other key tasks, are completed as a part of this milestone.
3. **Add surveillance and advanced communication capabilities**—The Coast Guard plans to convert the C-27J from a cargo aircraft to a multi-mission aircraft with both cargo and surveillance capabilities to fully meet Coast Guard mission requirements.



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## Induct the Aircraft

The Coast Guard is in the process of developing a baseline induction process for the C-27J; however, Coast Guard program officials stated that until they understand the condition of each aircraft, they cannot estimate how long it will take to induct each plane. The first part of induction entails removing the aircraft from the AMARG storage facility, which involves taking off a protective compound, conducting system checks and basic maintenance, and successfully completing a flight test—among other steps. Figure 5 shows one of the Coast Guard’s C-27Js in preserved status at AMARG.

**Figure 5: Preserved C-27J at the Air Force Aerospace Maintenance and Regeneration Group**



Source: U.S. Government Accountability Office. | GAO-15-325

Once the first part of the induction process is complete, the aircraft is flown to the Coast Guard’s aviation maintenance center, called the Aviation Logistics Center, where the Coast Guard has established a project office responsible for completing the induction process and fielding the C-27Js. Currently, this project office is assessing the first two planes and establishing the key steps necessary to fully induct the aircraft, such as incorporating the aircraft into the Coast Guard maintenance system, building up the Coast Guard’s knowledge of the aircraft by conducting training and test flights, repairing physical damage (if any), replacing missing parts, and creating Coast Guard operational and maintenance documents and procedures. When completing these steps, complications can arise. For example, program officials stated that the C-27J uses a liquid oxygen based aircrew breathing system similar to

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the HC-130J. All other Coast Guard fixed wing aircraft use oxygen in gas form; thus, the Coast Guard has to write new policies and train users on how to work with this material on the C-27J.

The Coast Guard expects it will take about 9 months to induct the first two aircraft and, therefore, plans to have them ready for operations by fiscal year 2016. According to Coast Guard officials, the amount of time required to induct subsequent C-27J aircraft should decrease after the Coast Guard develops logistics, maintenance, and training systems with the first two aircraft. In addition, in February 2015, the Coast Guard signed a sole-source contract with Alenia Aermacchi for on-the-ground troubleshooting support, which should also help to speed up the induction process. Further, because a significant part of the induction process involves integrating the C-27J into the Coast Guard's maintenance system, the time needed to induct future planes should also decrease as maintenance and training procedures, among others, are developed and documented. Thus far, to augment and develop its in-house maintenance capabilities, the Coast Guard spent \$3.2 million for 1 year of contractor logistics support under a pre-existing USASOC contract with Lockheed Martin set to expire in August 2015. The Coast Guard has decided to exercise an option for this contract for an additional year while it builds the capacity necessary to maintain the plane using Coast Guard personnel and procedures.

#### Establish Operational Units

The Coast Guard plans to establish the first C-27J operational unit in fiscal year 2016 in California with four fully inducted C-27Js; a second undetermined location (likely on the east coast) is tentatively scheduled to begin initial operations in fiscal year 2018. Coast Guard officials added that plans for additional bases, if necessary, are not yet finalized. According to Coast Guard aviation program managers, the C-27J fleet will be based where it is most needed to help the Coast Guard fulfill its drug and migrant interdiction, disaster response, and search and rescue missions, among the Coast Guard's other missions.

To establish the first base, pilots, aircrew, and aircraft maintenance personnel all need training to effectively and safely operate and maintain the C-27J. The Coast Guard plans to train an initial cadre of approximately 20 pilots and 80 aircrew and maintenance personnel to stand-up the base in California. In addition, the Coast Guard plans to build a \$12 million maintenance training facility for the HC-144 and the C-27J. In May 2014, the Coast Guard signed a \$434,000 sole-source contract with Alenia Aermacchi to train two Coast Guard pilots and two aircrew members in Pisa, Italy. These personnel completed training in

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## Add Surveillance and Advanced Communication Capabilities

September 2014. In addition, the Coast Guard is in the process of contracting for the use of a C-27J flight simulator.

To meet its requirements, the Coast Guard has to convert the C-27J from a cargo aircraft to a multi-mission aircraft with both cargo and surveillance capabilities—a \$300 million effort, according to initial Coast Guard estimates. These capabilities are enabled by a mission system that primarily consists of a surface-search radar, electro-optical infrared camera, and advanced communication capabilities to process and distribute data gathered by these sensors. The process of adding a mission system is called missionization. The Coast Guard plans to use a mission system known as Minotaur—already in use by the Navy for aviation surveillance activities—for all of its medium and long range surveillance aircraft, including the C-27J. United States Customs and Border Protection also uses this system for its surveillance aircraft, potentially increasing the communication and data sharing across DHS.

The Coast Guard is in the early stages of replacing obsolete and poorly performing mission systems on its existing fixed-wing fleet of HC-130Js and HC-144s with the Minotaur system. In November 2014, the Coast Guard completed a preliminary design review for the HC-130J system and plans to begin installation of a prototype mission system this summer. Prototyping and testing a system for the HC-144 is dependent on the schedule for the HC-130J, but is currently planned to be completed in fiscal year 2016.<sup>8</sup> The C-27J will be the last to have the mission system incorporated. To begin this effort, the Coast Guard entered into a \$1 million agreement with the Navy's Naval Air Warfare Center in November 2014 to evaluate mission system options on the C-27J. The Coast Guard tentatively estimates that it will have a C-27J mission system prototype by fiscal year 2017 and, following testing, plans to install and integrate this equipment on additional aircraft beginning in fiscal year 2018. Notionally, all 14 C-27Js are to have mission systems incorporated by fiscal year 2022.

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<sup>8</sup> The HC-130H is not planned to receive this new mission system because the Coast Guard is in the process of removing them from service over the next 6 years.

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## The Coast Guard Must Address Risks Related to Spare Parts, Technical Data, and Understanding the Condition of the Aircraft

The successful and cost effective fielding of the C-27J is contingent on the Coast Guard's ability to address three risk areas, related to the following:

- **Purchasing spare parts**—The Coast Guard had to develop its own list of spare parts for the aircraft, as existing lists are not available. Further, the Air Force and USASOC have had difficulties obtaining some spare parts.
- **Accessing technical data**—The Coast Guard does not have full access to the technical data for the C-27J, which are required to maintain the aircraft over the long term and make modifications to the aircraft's structure—for example, to install sensors.
- **Understanding the condition of the aircraft**—The condition of each of the Coast Guard's C-27Js is not fully known; for example, the Coast Guard found an undocumented dent on one aircraft taken out of AMARG and its 14th plane—still owned by L-3 Communications—was not properly preserved.

We have identified these three areas as risks because they represent knowledge gaps for the Coast Guard and will likely require the largest amount of resources during the process of fielding 14 fully capable aircraft. For example, accessing technical data is key to installing surveillance capabilities—an effort planned to cost \$300 million. In addition, these are areas in which the Air Force and USASOC have experienced difficulties while operating the C-27J. In combination, these risk areas could inhibit the number of hours per year that the C-27J will be fully capable of accomplishing its missions and add additional costs to these efforts.

To mitigate some of these risks, the Coast Guard is formulating a partnership with USASOC to collaboratively maintain the C-27Js owned by both services. For example, USASOC purchased technical manuals, which it is sharing with the Coast Guard, while the Coast Guard is contracting for a field service representative to work with both fleets. In addition, the Coast Guard began participating in a user group with the other countries that operate the C-27J, including Italy and Greece, though this user-base is limited since only 76 C-27s have been sold by Alenia Aermacchi (including the 21 C-27Js that belong to the United States government). In general, Coast Guard officials have characterized these risks as “good problems to have” because they are receiving 14 aircraft without reimbursement and they see the C-27J as a valuable addition to the Coast Guard's fixed-wing fleet.

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## Purchasing Spare Parts

Spare parts are essential to keeping aircraft operational, but USASOC and the Air Force have experienced a number of setbacks related to acquiring necessary parts, particularly from Alenia Aermacchi. While the Air Force was operating the C-27J, it encountered issues keeping its fleet in operable condition due to difficulties with obtaining spare parts. For example, at the time the Air Force canceled the C-27J program, 11 of 14 planes were missing parts. Further, to support the deployment of two C-27Js to Afghanistan in July 2011, the Air Force built a large pool of spare parts by purchasing \$65 million worth of spares from L-3 Communications. Due to delivery delays from Alenia Aermacchi, parts were taken from a C-27J that was still in production at L-3 Communications. Using these parts, the C-27Js were in operable condition 83 percent of the time from July 2011 to June 2012. However, creating such a large and expensive pool of spares, relative to the number of aircraft, is not a sustainable approach that the Coast Guard can apply to maintaining its planes.<sup>9</sup> Further, the Air Force did not obtain access to key data such as spare parts demand information and ordering history and, therefore, could not provide these data to the Coast Guard.

Since it began operating C-27Js in fall 2013, USASOC has made some progress purchasing spare parts, though purchasing directly from Alenia Aermacchi continues to present significant challenges, due to parts pricing and delivery delays. Air Force and L-3 Communications officials estimate that Alenia Aermacchi controlled up to 90 percent of the spare parts for the C-27J. Through the efforts of its own logistics support contractor, however, as of November 2014, USASOC has had to order only 24 percent of the parts it needs directly from Alenia Aermacchi, with the remainder coming directly from the original parts manufacturers or U.S. government-approved suppliers. However, the 24 percent of parts that USASOC ordered from Alenia Aermacchi comprised 40 percent of USASOC's total spending on spare parts; thus, Alenia Aermacchi remains a significant stakeholder. Further, USASOC has had issues with pricing and delayed deliveries. Alenia Aermacchi has increased the price of parts on two USASOC purchases; for example, USASOC purchased a refueling valve that previously cost \$10,998, but it now must pay \$15,121

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<sup>9</sup> Alenia Aermacchi also struggled to supply spare parts for the predecessor to the C-27, an aircraft called the G.222, purchased by the U.S. Air Force for the Afghan Air Force. In January 2013, the DOD Inspector General found that spare parts for the G.222 were prohibitively expensive or unavailable for purchase, resulting in the fleet flying only 5 percent of its planned mission hours.

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for the part—a 37 percent increase. In addition, USASOC officials have been frustrated by the length of time Alenia Aermacchi has taken to provide parts. For example, as of November 2014, USASOC had received 70 percent of the parts ordered from non-Alenia Aermacchi suppliers but only 3 percent of the parts ordered from Alenia Aermacchi. While Alenia Aermacchi officials recognize that there have been issues with spare parts in the past, they told us that the company has recently changed its logistics model and has the capability to fully support the Coast Guard's C-27Js. Further, according to USASOC contracting officials, difficulties with Italian export controls have slowed the spare parts and parts repair processes. Alenia Aermacchi is in the process of applying for Italian export control licenses for USASOC and the Coast Guard. Once approved, these licenses will reduce delays attributable solely to export issues—usually around 30 to 90 days—according to Alenia Aermacchi officials.

The Coast Guard has already encountered some challenges with purchasing spare parts. For example, when removing aircraft from AMARG it is standard procedure to replace the aircraft's filters. In doing so, the Coast Guard was able to purchase only half of the filters through U.S. government approved suppliers. The remaining filters had to be purchased directly from Alenia Aermacchi because they were unavailable from other sources. To mitigate export control delays, Coast Guard officials said they used Alenia Aermacchi filters from USASOC's warehouse and paid for replacements to USASOC's inventory.

Developing an initial set of spares for the C-27J, estimated to cost \$8 million per aircraft, is another significant area of risk.<sup>10</sup> The Coast Guard received data from other countries' air forces that fly the C-27J and, using these data, have developed its own initial list of spares. The Coast Guard must now find suppliers for these parts and then determine what portion of these parts are economical to keep on-hand in the Coast Guard's supply chain. Further, according to Coast Guard project officials, significant learning will occur as the Coast Guard inducts the C-27J and generates its own data, as it starts flying the aircraft, on the failure rate of the aircraft's parts. These data will allow the Coast Guard to fine tune the list of spare parts before the aircraft are fielded.

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<sup>10</sup> Initial spares are the total quantity and types of spare aircraft parts required to have on-hand to be reasonably certain that the aircraft will be available for operations as required.

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Lastly, the Coast Guard plans to fly its aircraft at a more aggressive operating pace—up to 1,000 hours per year compared to about 500 hours per year for the Air Force and USASOC—and in a maritime environment, which is generally more demanding on assets due to increased corrosion from the saltwater environment. Thus, its spare parts needs are likely to be much higher than USASOC and the Air Force.

## Accessing Technical Data

The Coast Guard does not yet have sufficient access to technical data to fully support, maintain, and operate the C-27J.<sup>11</sup> Alenia Aermacchi is the sole owner of the full technical data associated with the C-27J aircraft. Coast Guard project officials said they have approached the company about acquiring a technical data licensing agreement.<sup>12</sup> The Coast Guard plans to meet immediate technical data requirements by utilizing resources under the Alenia Aermacchi field service representative contract. The Coast Guard continues to explore various options for accessing this key information. These options can vary depending upon the three basic types of technical data for aircraft:

1. **Flight and maintenance manuals**—These manuals provide all of the information required to safely and effectively fly and maintain the aircraft—including detailed guidance on maintenance and flight procedures—and function as the foundational documents necessary for properly operating the aircraft. In 2014, the Air Force supplied the Coast Guard with two sets of flight and maintenance manuals. The first set, produced by L-3 Communications, translated the Alenia Aermacchi manuals into Air Force-specific language and also covered the modifications made to the plane by L-3 Communications. These manuals were updated through March 2013 but never fully completed. The second set, produced by Alenia Aermacchi, pertained only to the aircraft in its originally manufactured condition prior to modifications. This set continued to be updated by Alenia Aermacchi until the Air Force transferred them to the Coast Guard in February 2014. USASOC has since purchased flight and maintenance manuals from

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<sup>11</sup> Technical data for weapon systems include drawings, specifications, standards, and other details necessary to ensure the adequacy of item performance, as well as manuals that contain instructions for installation, operation, maintenance, and other actions needed to support weapon systems.

<sup>12</sup> In 2012, the Australian Department of Defence signed an AUD \$58 million contract, approximately equivalent to \$44 million U.S. dollars based on current exchange rates, with Alenia Aermacchi solely for intellectual property not owned by the United States.

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Alenia Aermacchi, according to Coast Guard project officials, and provided the Coast Guard access to them. The Coast Guard is in the process of contracting for Coast Guard-specific instructions based on these manuals for how to conduct basic aircraft maintenance.

2. **Depot level maintenance data**—During periodic depot level maintenance, the Coast Guard conducts major airframe inspections and completes required repairs, which allows the service to accomplish its missions with fewer resources over the long run. These depot maintenance periods typically include removing large portions of the aircraft to address core corrosion and rebuild key parts, including engine work. At the time the Air Force canceled its C-27J program, it was in the process of pursuing the data required for depot maintenance from L-3 Communications, the lead contractor. However, since Alenia Aermacchi owned the data, this process would have been complex and, according to Air Force officials, was unsuccessfully resolved. The extent to which the Coast Guard can develop depot level maintenance procedures and conduct its own engineering activities on the C-27J with only the basic flight and maintenance manuals is unknown at present. The Coast Guard has significant experience conducting depot maintenance on aviation assets, which, according to project office officials, increases its ability to overcome knowledge gaps associated with the lack of technical data.
3. **Design and manufacturing data**—These data contain information such as the expected fatigue life—how long components last—of pieces of the airframe and information required to manufacture key parts. Access to design and manufacturing data is needed when modifications are required to the aircraft, such as to add capability, and manufacturing data are useful for competitively purchasing parts or determining the cause of parts failures. Alenia Aermacchi has sole ownership and access to these data. According to project officials, the Coast Guard could purchase access to these data from Alenia Aermacchi, either on an as-needed basis or in bulk. Alternatively, Coast Guard officials added that they can learn about the aircraft through testing, reverse engineering, and/or experimentation. Coast Guard project officials stated that these options would require significant resources, and that they will likely use a combination of these approaches.

Without access to technical data for the C-27J, the Coast Guard faces risks related to controlling costs and maintenance issues and installing surveillance capabilities. Technical data can enable the government to complete maintenance work in-house, as well as to competitively award



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acquisition and sustainment contracts. In July 2010, we reported that for service contracts pertaining to DOD weapons programs, the lack of access to proprietary technical data and a heavy reliance on specific contractors for expertise limits or precludes the possibility of competition.<sup>13</sup> Further, in May 2011, we reported that access to technical data is needed to help control costs and maintain flexibility in the acquisition and sustainment of DOD weapon systems.<sup>14</sup> In addition, the lack of technical data could ground the aircraft for longer periods than necessary. For example, Air Force program officials told us about a severe 2012 mishap with one of its C-27Js that grounded its fleet for several months while Alenia Aermacchi investigated the incident. As Alenia Aermacchi had sole access to the technical data, the Air Force was reliant on it to conduct the investigation. After several months, Alenia Aermacchi determined that the issue was the result of improper manufacturing of an aircraft component at one of its suppliers' facilities. The Air Force then had to wait approximately 10 months while the parts were re-made by the supplier and sent to the Air Force. Alenia Aermacchi officials have expressed interest in serving as the sole maintenance provider for the Coast Guard and USASOC's aircraft as it does for many of its international customers. Alenia Aermacchi officials note that they are also accustomed to supporting agencies doing their own maintenance by providing field service representatives, engineering support, and technical publications.

The process of installing surveillance capabilities on the C-27J will be shaped by the extent to which the Coast Guard can access design and manufacturing data for the C-27J. The first step in this process is purchasing the main sensor systems, a surface search radar and electro-optical infrared camera, and installing them on the aircraft. However, this task is risky and could reduce capability if the Coast Guard does not gain access to the C-27J's technical data. For example, on the HC-130J, the Coast Guard mounts the surface-search radar on the aircraft's fuselage. However, such modification to an aircraft requires technical data to determine the impact on its structural integrity. Without access to the

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<sup>13</sup> GAO, *Federal Contracting: Opportunities Exist to Increase Competition and Assess Reasons When Only One Offer Is Received*, [GAO-10-833](#) (Washington, D.C.: July 26, 2010).

<sup>14</sup> GAO, *Defense Acquisition: DOD Should Clarify Requirements for Assessing and Documenting Technical-Data Needs*, [GAO-11-469](#) (Washington, D.C.: May 11, 2011).

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## Understanding the Condition of the Aircraft

necessary data, the Coast Guard would be reliant on Alenia Aermacchi to perform the engineering required to mount the radar. However, the Coast Guard is looking into alternatives that would require access to fewer data. According to Coast Guard and USASOC officials, two possibilities for the C-27J that would require a limited amount of technical data include (1) mounting the electro-optical infrared camera on one of the aircraft's doors and (2) modifying the surface-search radar to fit on the nose of the aircraft—replacing the existing weather radar, which may no longer be necessary because the new radar would also perform weather-related tasks. While possible, such an approach could require performance trade-offs—such as limiting the coverage of the radar and the camera.

An additional risk for the Coast Guard is addressing the physical condition of the 14 aircraft. USASOC has experienced a number of premature failures and unexpected maintenance with its C-27Js that could also be an issue for the Coast Guard. So far, during the 700 hours flown by the 6 operational USASOC aircraft between January 2014 and November 2014, they have had the following problems:

- Fuel leaks were found in the wings of the aircraft, which are designed to hold fuel similar to many commercial aircraft. The seams and joints of three of USASOC's seven aircraft were poorly sealed upon delivery of the aircraft, requiring significant repairs.
- The landing gear on one aircraft extended during landing without pilot instruction due to a landing gear component deficiency, which is a safety issue and grounded the aircraft.
- Wheel assemblies on multiple aircraft were improperly constructed.
- A cracked bracket required an aircraft to be grounded for 58 days.
- A crack was discovered in a structural piece surrounding the left wheel on four aircraft.
- Problems were found with four different types of valves, including fuel and de-icing valves on multiple aircraft.
- Oxygen system leaks due to manufacturing errors on multiple aircraft.

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Some of these issues are related to major manufacturing problems and are consistent with findings of the Defense Contract Management Agency, which oversaw the C-27J manufacturing process on behalf of the Air Force. For example, in March 2013, the Defense Contract Management Agency issued a request for L-3 Communications, as the lead U.S. partner, to correct poor practices at Alenia Aermacchi that would seriously compromise the reliability and safety of the C-27J if not corrected. This corrective action request has been closed, but the extent to which these problems extend through the Coast Guard's 14 C-27Js, built prior to these changes, is unknown.

While USASOC experienced the problems noted above on brand new aircraft, the Coast Guard is receiving aircraft that the Air Force previously used. When removing the first two planes from storage at AMARG, the Coast Guard discovered numerous, though relatively minor, issues that delayed delivery of the planes to the Coast Guard's Aviation Logistics Center by a few weeks. For example, the Coast Guard discovered a dent on the underside of one C-27J that was not properly documented and also found some corrosion, particularly with bolts on the wings of the aircraft, which it replaced on both aircraft. Coast Guard officials stated that the manufacturer may have installed the wrong bolts on the aircraft. Coast Guard and Air Force officials determined that the first two aircraft that they removed from AMARG are likely in the best condition. Two of the most heavily used aircraft destined for the Coast Guard supported the contingency operation in Afghanistan for 11 months. The Coast Guard will continue to assess the condition of the other 11 planes as they are removed from storage, which officials have identified as an area of concern.

Apart from the 13 aircraft that have been stored at the AMARG, the 14th plane destined for the Coast Guard is also missing parts and has been stored outdoors since 2011 without being preserved by L-3 Communications (which still owns the aircraft). L-3 Communications officials told us that they did not properly maintain the aircraft's engines and propellers because parts required to run the engines, necessary for proper maintenance, were used for other C-27Js and not replaced in a timely manner. However, L-3 Communications, at its expense, recently sent the engines and propellers to be serviced by the original manufacturer and these items are now properly stored. In October 2014, we observed the aircraft at L-3 Communications' facility in Waco, Texas. The aircraft's engines and propellers were not installed but were stored in a nearby hangar consistent with original equipment manufacturer direction, according to L-3 officials. However, the cockpit was missing

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several components related to communications and operations functions, and the body of the aircraft showed some corrosion—particularly under each wing. L-3 Communications is now in the process of replacing 11 key missing parts taken from the aircraft to support the Afghanistan deployment and other C-27Js. At the time of our visit, L-3 Communications officials were optimistic that the aircraft would be delivered to the Coast Guard in working condition by February 2015, pending the delivery of the missing parts.<sup>15</sup> However, as of March 2015, Alenia Aermacchi had yet to deliver these parts to L-3 Communications. L-3 Communications is now planning to deliver the aircraft to the U.S. Government in June 2015, pending the delivery of parts expected by late March 2015. Given that the airplane was not stored in accordance with Air Force procedures and has been used for spare parts, there will likely be some maintenance issues that L-3 Communications will have to address before it can deliver the aircraft to the U.S. Government.

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## Current Fixed-Wing Fleet Plan Achieves Savings but Does Not Meet Flying Hour Needs, and Revised Analysis Is Years Away

The C-27J will improve the affordability of the Coast Guard's fixed-wing fleet, but the current fleet of aircraft that the Coast Guard is pursuing is not optimal in terms of cost and flight hour capability. We estimate that the Coast Guard's current plan should save \$795 million over the next 30 years, compared to the 2013 estimate of \$837 million.<sup>16</sup> However, the source of these savings has shifted. A significant portion of the savings now results from a drop in the number of flight hours the fleet will achieve due to reducing the planned quantity of aircraft. For example, the 2013 plan achieves the Coast Guard's stated goal of 52,400 flight hours per year, while the current plan achieves 43,200 flight hours per year—an 18 percent reduction. This reflects a shift from a fleet of 58 planes primarily composed of less-expensive HC-144s, to a fleet of 54 planes composed of a higher number of larger and more expensive HC-130Js. Operating more HC-130Js results in more expensive flight hours per year. The Coast Guard is in the process of examining, in several stages, its mission needs, including whether the current flight hour goal is still sound. But the results will not be used to inform budgets prior to fiscal year 2019. In the meantime, DHS and the Coast Guard have paused the HC-144 acquisition program, but historically the Coast Guard has received C-130J

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<sup>15</sup> Technically, this aircraft will be delivered to the Air Force and then transferred to the Coast Guard to conform with existing contractual arrangements.

<sup>16</sup> Fiscal year 2015 dollars.

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aircraft without budgeting for them. The Coast Guard already owns 20 aircraft that are not yet operational, including 14 C-27Js and 6 HC-130Js, and are planned to be outfitted with surveillance capabilities in the coming years. If the Coast Guard continues to receive additional aircraft before the results of the study are known, options for optimizing its fleet mix may be limited.

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**Current Fleet Plan Should Save Money but Does Not Meet Flight Hour Goal**

To determine the potential impact of the C-27J on the cost and flight hour capability of the Coast Guard's fixed-wing fleet, we compared three scenarios:

- the 2007 program of record (without the C-27J), to which we applied updated assumptions and the data in the Coast Guard's business case,
- the Coast Guard's C-27J business case as presented to Congress in 2013, and
- the Coast Guard's current plan, to which we applied updated assumptions and the data in the Coast Guard's business case.

Table 2 shows the total planned number of aircraft in each fleet we compared, the total cost to fly the aircraft for the next 30 years, total flight hours over the next 30 years, and the total estimated savings of each fleet compared to the program of record.

**Table 2: Aircraft Fleet Quantities, Cost, Flight Hours, and Anticipated Savings over the Next 30 Years**

Fiscal year 2015 dollars

| Fleet composition (quantity of aircraft)                                          | GAO analysis of the Coast Guard's 2007 program of record |       |                 | Coast Guard's August 2013 letter to Congress |       |         | GAO analysis of the Coast Guard's current fleet plan |       |         |
|-----------------------------------------------------------------------------------|----------------------------------------------------------|-------|-----------------|----------------------------------------------|-------|---------|------------------------------------------------------|-------|---------|
|                                                                                   | HC-144                                                   | C-27J | HC-130J         | HC-144                                       | C-27J | HC-130J | HC-144                                               | C-27J | HC-130J |
|                                                                                   | 36                                                       | 0     | 22 <sup>b</sup> | 25                                           | 14    | 19      | 18                                                   | 14    | 22      |
| <b>Total cost (acquisition and operating) of fleets over 30 years<sup>a</sup></b> | \$14,285 million                                         |       |                 | \$13,448 million                             |       |         | \$13,490 million                                     |       |         |
| <b>Flight hours over the next 30 years</b>                                        | 1,326,800                                                |       |                 | 1,313,200                                    |       |         | 1,219,820                                            |       |         |
| <b>Total savings compared to the program of record over the next 30 years</b>     | N/A                                                      |       |                 | \$837 million                                |       |         | \$795 million                                        |       |         |

Source: GAO analysis based on the data in the Coast Guard's May 2012 business case analysis (which informed the Coast Guard's August 2013 letter to Congress), and other Coast Guard data.  
GAO-15-325

Note: Numbers may not add up due to rounding.

<sup>a</sup> The total cost calculations, similar to the Coast Guard's C-27J business case, looks at the Coast Guard's costs for the next 30 years. Thus, it includes receiving the C-27J airframe without reimbursement. However, the cost of the airframe is only a portion of C-27J acquisition costs, which include purchasing sets of initial spares, flight trainers, and adding surveillance capabilities.

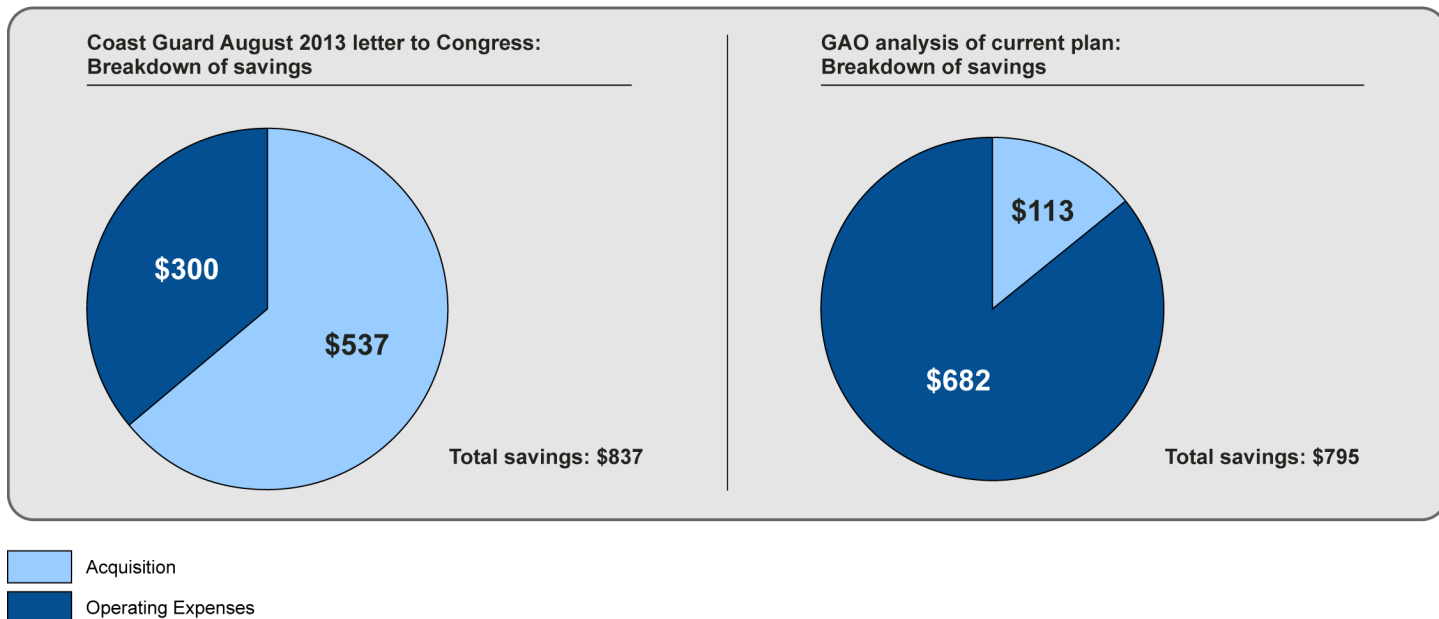
<sup>b</sup> In 2007, the Coast Guard planned on a fleet of 16 upgraded HC-130Hs and 6 HC-130Js. In 2011, the Coast Guard updated these plans to pursue a fleet of 22 HC-130Js. These changes were incorporated into the Coast Guard's program of record.

We found that the Coast Guard's current plan should save \$795 million over the next 30 years compared to the program of record fleet.<sup>17</sup> While the amount of savings is similar to the \$837 million estimated by the Coast Guard in 2013, the source of these savings has shifted, as shown in figure 6. The Coast Guard's savings in the initial plan were largely due to acquisition cost savings. However, in the current plan, the savings are now largely due to operating expenses based on the Coast Guard's planned reduction in flight hours.

<sup>17</sup> Not factored into the 2013 letter to Congress, 2012 business case, or our total calculations, is that the Coast Guard paid \$198 million for upgrades to HC-130H aircraft that are now being transferred or decommissioned. Prior to the transfer of the C-27Js, the Coast Guard was planning on utilizing these upgraded aircraft for several more years.

**Figure 6: Comparison of Savings Between the Fleet Presented to Congress in August 2013 and the Coast Guard's Current Fleet Over the Next 30 Years as They Relate to the Program of Record**

Fiscal year 2015 (U.S. dollars in millions)



Source: GAO analysis of Coast Guard data. | GAO-15-325

Note: The Coast Guard's 2013 Letter to Congress is based upon data and calculations in the May 2012 business case, which among other things assumed that all of the aviation assets have a 30 year service life and the HC-144 flies 1,200 hours per year. GAO's assessment of the Coast Guard's current plan uses the actual planned service lives for each asset and 1,000 flight hours for the HC-144. See appendix I, which details the objectives, scope, and methodology for additional information.

In its August 2013 letter to Congress, the Coast Guard stated that receiving 14 C-27Js would save money without reducing planned flight hours below its goal of 52,400 hours per year, set forth in the Coast Guard's 2005 mission needs statement. To do this, the Coast Guard planned to replace three HC-130Js with three C-27Js, gaining 600 flight hours per year at a lower cost per flight hour, and to decommission its HC-130Hs sooner than originally planned. However, the Coast Guard has since changed its planned fleet composition, and is now on a path to replace 14 HC-144s with 14 C-27Js and buy all 22 of the HC-130Js as planned in the program of record. This change results in 9,200 fewer flight hours per year (an 18 percent reduction) once the currently planned fleet is fully operational. Also contributing to this reduction of flight hours is the current plan to purchase 4 fewer medium range aircraft (HC-144s and C-27Js) and reduce the HC-144 flight hours from 1,200 to 1,000 hours per

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year—due primarily to the high cost of maintaining the aircraft while flying at the higher pace.

Table 3 shows: (1) the aircraft that comprise each fleet plan, (2) the planned annual flight hours once each fleet is built, and (3) the difference in flight hours, if any, based on the planned flight hours per year. We calculated this difference using the Coast Guard's goal of 52,400 annual flight hours as a baseline. The table also includes the actual quantity and flight hour performance of the fleet, as of 2014, as a basis for comparison.



**Table 3: Flight Hour Performance of Actual and Planned Fixed-Wing Fleets**

|                                                                                                          | 2014 fleet |                      |         | 2007 program of record |       |         | Coast Guard's August 2013 letter to Congress |       |         | GAO analysis of the Coast Guard's current plan |       |         |
|----------------------------------------------------------------------------------------------------------|------------|----------------------|---------|------------------------|-------|---------|----------------------------------------------|-------|---------|------------------------------------------------|-------|---------|
| Fleet composition (total quantity of aircraft)                                                           | HC-144     | HC-130H <sup>a</sup> | HC-130J | HC-144                 | C-27J | HC-130J | HC-144                                       | C-27J | HC-130J | HC-144                                         | C-27J | HC-130J |
|                                                                                                          | 16         | 20                   | 5       | 36                     | 0     | 22      | 25                                           | 14    | 19      | 18                                             | 14    | 22      |
| Flight hours per year                                                                                    | 32,543     |                      |         | 52,400                 |       |         | 52,400                                       |       |         | 43,200                                         |       |         |
| Difference based on the program of record goal of 52,400 flight hours (planned or actual hours / 52,400) | 38%        |                      |         | 0%                     |       |         | 0%                                           |       |         | 18%                                            |       |         |

Source: GAO analysis based on the data in the Coast Guard's May 2012 business case analysis (which informed the Coast Guard's August 2013 letter to Congress), current operational plans, and other Coast Guard data. GAO-15-325

Notes: Numbers may not add up due to rounding.

<sup>a</sup> This also includes some other legacy aircraft.

In conducting our analysis, we used the Coast Guard's 2012 business case analysis but modified the planned flight hours for the HC-144 and the C-27J. The program of record and the 2012 business case assumed that the HC-144 would fly 1,200 hours per year but the Coast Guard plans on flying the HC-144 and the C-27J for 1,000 hours per year.

In all, the Coast Guard's current plan is still an improvement over the flight hours recorded in fiscal year 2014, when the Coast Guard flew 38 percent fewer hours compared to its stated needs. As reflected in the table, however, the current plan also would result in a flight hour shortfall compared to the program of record.

## Coast Guard Also Faces Shortage in Surveillance Capability

In addition to the reduction in its planned flight hours, the Coast Guard also has a shortage in its capability to meet its surveillance needs. To fully meet its needs, the Coast Guard must fly 52,400 hours per year with assets capable of conducting surveillance missions with advanced communication capabilities, such as sharing data. The Coast Guard's 2005 mission needs statement directed the Coast Guard's fixed wing fleet to be comprised of assets with improved surveillance capabilities, which would allow the Coast Guard to become more proactive through increased presence and surveillance rather than responding to events as they occur.

The Coast Guard has not been able to build up its flight hours as quickly as planned in 2007. The Coast Guard planned for the HC-144 and HC-130J, the two fixed wing assets in the program of record fleet planned to

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be outfitted with improved surveillance capabilities, to conduct surveillance consistent with the surveillance goal. The C-27J, once missionized, is also planned to have improved surveillance capabilities. However, in 2014, the 16 HC-144s and the 5 HC-130Js that are currently missionized and operational flew only 16,381 hours, about 31 percent of the overall need. The remaining flight hours in 2014 were flown by HC-130Hs and other legacy aircraft that do not have surveillance capabilities consistent with the Coast Guard's needs. The result, in fiscal year 2014, was a 69 percent difference in these capabilities compared to the Coast Guard's 2005 mission needs statement.

Further, the surveillance shortage in today's fixed wing fleet is likely larger than 69 percent because the mission systems on the HC-144 and HC-130J are not yet fully effective. For example, the Navy had to use non-Coast Guard software to assess the capabilities of the HC-130J's radar after determining that the software the Coast Guard uses does not work well with the aircraft's sensors. Moreover, we found in June 2014 that the HC-144 did not meet key performance parameters related to surveillance during operational testing.<sup>18</sup> Replacement of the current mission system, already underway, is planned to address the majority of deficiencies. Once missionized, the HC-144, C-27J and HC-130J will reduce the current surveillance shortage since these aircraft will comprise increasingly larger proportions of the fleet over the next decade.

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### Current Fleet Plan Will Cost More per Flight Hour

While the fixed-wing fleet that the Coast Guard is currently pursuing should save \$795 million over 30 years, it will have a higher average cost per hour of flight. The Coast Guard's long-term approach, as reflected in the current plan, is to replace HC-144s with C-27Js that cost approximately \$1,000 more per flight hour. This is a shift from the plan as presented to Congress in 2013, which proposed replacing some of the more expensive to operate HC-130Js with C-27Js. Both plans propose replacing the HC-130H as soon as possible compared to the program of record, which will improve the overall cost per hour of flight.

As table 4 illustrates, the current proposed mix of aircraft will cost \$11,059 per hour of flight, which is greater than the program of record and the fleet

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<sup>18</sup> [GAO-14-450](#). In this report, the Coast Guard stated that it plans on demonstrating that the HC-144 meets its surveillance requirements during follow-on testing, which is planned to take place after the aircraft receives its new mission system.

described to Congress in 2013. While the Coast Guard's current plan preserves much of the anticipated savings from receiving the 14 C-27Js and increases the number of flight hours compared to the fleet the Coast Guard is operating today, it results in fewer flight hours for the dollar.

**Table 4: Flight Hour Costs for the Coast Guard's Proposed Fixed-Wing Fleets over the Next 30 Years**

| Fiscal year 2015 dollars                                                        |                                                          |       |         |                                              |       |         |                              |       |         |
|---------------------------------------------------------------------------------|----------------------------------------------------------|-------|---------|----------------------------------------------|-------|---------|------------------------------|-------|---------|
| Fleet composition (total quantity of aircraft)                                  | GAO analysis of the Coast Guard's 2007 program of record |       |         | Coast Guard's August 2013 letter to Congress |       |         | GAO analysis of current plan |       |         |
|                                                                                 | HC-144                                                   | C-27J | HC-130J | HC-144                                       | C-27J | HC-130J | HC-144                       | C-27J | HC-130J |
| Fleet composition (total quantity of aircraft)                                  | 36                                                       | 0     | 22      | 25                                           | 14    | 19      | 18                           | 14    | 22      |
| Flight hours over the next 30 years                                             | 1,326,800                                                |       |         | 1,313,200                                    |       |         | 1,219,820                    |       |         |
| Total cost (acquisition and operating) of fleets over 30 years <sup>a</sup>     | \$14,285 million                                         |       |         | \$13,448 million                             |       |         | \$13,490 million             |       |         |
| Total cost per hour of flight (total cost / total hours) over the next 30 years | \$10,767                                                 |       |         | \$10,241                                     |       |         | \$11,059                     |       |         |

Source: GAO analysis of all three fleets based upon the data in the Coast Guard's May 2012 business case analysis, which informed its 2013 letter to Congress. GAO-15-325

Note: Numbers may not add up due to rounding.

<sup>a</sup> This analysis, similar to the Coast Guard's business case, looks at the Coast Guard's costs for the next 30 years. Thus, it includes receiving the C-27J airframe without reimbursement. However, the cost of the airframe is only a portion of C-27J acquisition costs, which include purchasing sets of initial spares, flight trainers, and adding surveillance capabilities. For the total costs, this calculation used 1,000 flight hours per year for the HC-144 and C-27J for all three fleets.

## New Fleet Mix Study Ongoing but Results Are Years Away

The Coast Guard is currently conducting a fleet-wide analysis, including surface, aviation, and information technology, intended to be a fundamental reassessment of the capabilities and mix of assets the Coast Guard needs to fulfill its missions. The Coast Guard is undertaking this effort consistent with direction from Congress. The Howard Goble Coast Guard and Maritime Transportation Act of 2014 directed the Commandant of the Coast Guard to submit an integrated major acquisition mission needs statement that, among other things, identifies current and projected capability gaps using mission hour targets. This mission needs statement is to be completed concurrent with the President's fiscal year 2019 budget submission to Congress.<sup>19</sup> Specifically, the Coast Guard plans first to

<sup>19</sup> Pub. L. No. 113-281 § 215. The statement is to be submitted to the House committee on Transportation and Infrastructure and the Senate Committee on Commerce, Science, and Transportation.

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rewrite its mission needs statement and concept of operations by 2016. Then, it will use a complex model to develop the full fleet mix study, which will include a re-assessment of the fixed-wing flying hour goals. Based on this, the Coast Guard plans to recommend a set of assets that best meets these needs in terms of capability and cost. The Coast Guard plans to complete the full study in time to inform the fiscal year 2019 budget, though specific dates for these events have not been set forth.

The Coast Guard and DHS have undertaken several studies, starting in 2008, to reassess the mix of assets the Coast Guard needs. However, in 2011, we reported that it was unclear how DHS and the Coast Guard would reconcile and use these multiple studies to make trade-off decisions or changes to the program of record. To date, the Coast Guard has made no changes to its program of record based on these analyses.

The upcoming mission needs statement and subsequent fleet mix analysis will be important to inform decisions about the mix of fixed wing assets the Coast Guard needs and can afford. For example, our calculations and the Coast Guard's 2012 business case demonstrate that replacing HC-130Js with medium-range aircraft (such as the HC-144 and C-27J) adds flight hours and reduces costs. Specifically, the savings the Coast Guard presented to Congress in its 2013 letter were predicated on replacing three HC-130Js with three C-27Js. According to the Coast Guard, this action would add 600 flight hours per year and save \$322 million over the next 30 years. Further, the Coast Guard's analysis showed that replacing nine HC-130Js would add 1,800 flight hours per year and save nearly \$1 billion. According to Coast Guard officials, the fleet mix analysis will examine these cost savings while also accounting for the level of performance provided by the HC-130J compared to the other fixed-wing assets. Because the results of the fleet mix study will not be available for several years, decisions that are made in the interim will not be informed by the Coast Guard's analysis. To illustrate, if this fleet mix analysis were to establish needed flight hours at a lower number than the current 52,400 goal, the Coast Guard could end up with excess capacity. Further, if the analysis were to demonstrate that the optimal fleet mix is comprised of more medium-range aircraft and fewer long-range aircraft, then the Coast Guard is currently on a path to end up with a more expensive fleet than necessary and it would be too late to opt for a fleet with a greater number of flight hours for the dollar.

Coast Guard budget and programming officials recognize the aviation fleet may change based on the flight hour goals in the new mission needs statement and the overall fleet mix analysis. They therefore have not

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included any additional fixed-wing asset purchases in the Coast Guard's five-year budget plan. For example, DHS and the Coast Guard have formally paused the HC-144 acquisition program at 18 aircraft for the time being. In addition, the Coast Guard already owns 20 aircraft, received since fiscal year 2009, comprised of 14 C-27Js and 6 HC-130Js that are not yet fully operational. These aircraft are planned to be outfitted with surveillance capabilities in the coming years. In total, since 2000, the Coast Guard has received 12 HC-130Js, currently valued at approximately \$100 million each, without including them in its budget requests.<sup>20</sup> The Coast Guard's Major Systems Acquisition Manual provides that the Coast Guard must manage its portfolio of assets to ensure that public resources are wisely invested and that capital programming is an integrated process of a component's portfolio of capital assets to achieve its strategic goals and objectives for the lowest life cycle cost and least risk. Continuing to receive these aircraft in the coming years, while the Coast Guard revisits its fixed-wing mission needs, will diminish the Coast Guard's flexibility to optimize its fleet. Further, the Coast Guard may end up with aircraft it ultimately does not need.

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## Conclusions

The Coast Guard is in the process of revisiting its fixed-wing fleet needs while also addressing several unknowns regarding its newest asset, the C-27J. While the transfer of the C-27Js to the Coast Guard may save acquisition funds, the Coast Guard is still a long way from being able to operate these aircraft efficiently and effectively. Overcoming the issues we have highlighted is feasible. But it will take time and resources to ensure that the C-27J will be able to function as a Coast Guard medium-range surveillance asset, particularly in terms of adding surveillance capabilities and achieving 1,000 flight hours per year.

If the Coast Guard uses the C-27J to replace some HC-144s, as is the current plan, the Coast Guard will fall short of its flight hour goals over the next 30 years, but if the C-27J replaces some HC-130Js, the Coast

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<sup>20</sup> According to Coast Guard budget officials, Congress has provided these 12 HC-130Js through a variety of funding mechanisms. These officials added that while the Coast Guard has not directly asked for these assets, they are a welcome addition to the Coast Guard's fixed-wing fleet. For some of the HC-130Js, the Coast Guard has not received funding to add mission systems and purchase spares for these aircraft and, therefore, asked for and received funding for these purposes.

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Guard can achieve more flight hours at a lower cost. The Coast Guard has an opportunity to address these issues now, within the context of its ongoing effort to assess its overall fleet of fixed wing assets. For example, the fleet mix analysis will aid the Coast Guard in determining the right mix of assets between the HC-130J—which the Coast Guard views as a highly capable aircraft—or the greater number of lower cost flight hours provided by the HC-144 or similar aircraft. However, the study results are years away. In the meantime, although the Coast Guard has exercised prudence in pausing the HC-144 program, it may continue to receive HC-130Js before it knows that it needs these aircraft and before it has determined the capabilities of its C-27J fleet. As a result, if the Coast Guard continues to receive HC-130Js while it revisits its needs, the capability and cost of the Coast Guard’s fixed-wing fleet runs the risk of being dictated by the assets the Coast Guard already owns rather than what it needs. Until the fleet mix study is concluded, the Coast Guard does not know the quantities of each aircraft that optimally balance the capability and presence of its fixed-wing fleet. Because the Coast Guard already has HC-130J aircraft in the pipeline awaiting the addition of surveillance capabilities and sensors, any impact of halting the provision of these aircraft in the interim, prior to completion of the fleet mix study, would be mitigated.

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## Recommendations for Executive Action

We recommend that the Secretary of Homeland Security and the Commandant of the Coast Guard inform Congress of the time frames and key milestones for completing the fleet mix study, including the specific date when the Coast Guard will publish its revised annual flight hour needs and when it plans to inform Congress of the corresponding changes to the composition of its fixed-wing fleet to meet these needs.

We also recommend that the Commandant of the Coast Guard advise Congress to modify the provision of any additional HC-130Js, as appropriate, pending the findings of the fleet mix study.

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## Agency Comments and Our Evaluation

We provided a draft of this report to DHS for review and formal comment. In its comments, DHS concurred with our first recommendation but did not concur with our second recommendation. DHS’s written comments are reprinted in appendix II. We also provided a full draft of this report to DOD and draft sections of this report to Alenia Aermacchi and L-3 Communications, which provided us with technical comments that we incorporated as appropriate.

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In its letter, DHS stated that it disagreed with our analysis of cost and flight hours because it contains updated assumptions that are not carried through the entire report. During our review, the Coast Guard agreed that changing these assumptions would provide a more accurate understanding of the Coast Guard's current fixed-wing fleet costs and flight hours. DHS and Coast Guard officials stated that they are not planning to conduct an analysis of the Coast Guard's current fixed-wing aircraft plan. To assess this plan accurately, as discussed in the objectives, scope, and methodology of this report, we changed two key assumptions from the Coast Guard's 2013 letter to Congress. First, the HC-144 is now planned to fly only 1,000 hours per year compared to the original plan of 1,200 hours per year. Second, the original analysis assumed all of the Coast Guard's aircraft have a 30-year service life. In reality, each aircraft type is projected to have a different service life: 40 years for the HC-144; 30 years for the HC-130J; and 25 years for the C-27J. We applied these assumptions to all of our calculations and then compared our results with what the Coast Guard presented to Congress to determine what, if any, differences exist. We believe this analysis is necessary to understand changes the Coast Guard has made and how they compare to the total savings presented to Congress.

Regarding the first recommendation, on informing Congress of the time frames and milestones for completing the fleet mix study, DHS concurred with our recommendation but did not provide specific time lines for meeting this recommendation. Based upon a project schedule we received in fall 2014, DHS is currently working toward completing its full fleet mix analysis effort, including providing a revised statement of annual flight hour needs. The Coast Guard plans to complete its initial mission needs statement and concept of operations by 2016, but these documents will not identify the exact mix of assets the Coast Guard needs to meet its missions. Once these documents are complete, the Coast Guard will conduct further analysis to produce the fleet mix study. Based on the study, the Coast Guard plans to recommend a fleet of assets that best meets its needs and, according to officials, will take fiscal constraints into account. The time line for this second effort is unclear but officials told us that they plan for it to inform the fiscal year 2019 budget. We believe it is crucial for Congress and other stakeholders to understand when this information will be available so that key decisions can be made with accurate and up-to-date data. Further, Congress needs to know that the mix of the Coast Guard's fixed-wing fleet assets will likely change based upon the results of this study.

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DHS did not agree with our second recommendation, that the Commandant of the Coast Guard advise Congress to modify the provision of any additional HC-130Js pending the results of the fleet mix study. DHS stated that it would be inappropriate for the Coast Guard to provide additional guidance, beyond the President's budget, to the United States Congress on how to appropriate funds. The context for our recommendation reflects the fact that Congress uses many information sources to make decisions on how to appropriate funds that are not included in the President's budget, such as information provided through agency briefings and reports, input from congressional agencies, and other sources. The Coast Guard has initiated an assessment that it states will provide a definitive flight hour goal for its fixed-wing assets—and subsequently the number and type of aircraft to meet this need. Without knowing the outcome of that assessment, Congress risks providing aircraft that may be in excess of the Coast Guard's needs and that could result in an additional \$1 billion in costs to the Coast Guard. In the meantime, as several C-130Js are already in the pipeline and 14 C-27Js have recently been received, the Coast Guard has prudently decided to pause the HC-144 program while it reassesses its needs. If receiving more C-130Js could complicate or even obviate the fleet mix analysis, now is the time to so advise Congress.

DHS and the Coast Guard also provided technical comments that we incorporated into the report as appropriate.

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We are sending copies of this report to the Secretary of the Department of Homeland Security, Commandant of the Coast Guard, and Secretary of the Department of Defense. In addition, the report is available on our website at <http://www.gao.gov>.



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As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to your offices. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-4841 or [mackinm@gao.gov](mailto:mackinm@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

Sincerely yours,

A handwritten signature in cursive script that reads "Michele Mackin".

Michele Mackin  
Director, Acquisition and Sourcing Management

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# Appendix I: Objectives, Scope, and Methodology

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The objectives of this report were to determine (1) the status of the transfer of the C-27Js from the Air Force to the Coast Guard, including cost and schedule estimates, plans for testing, and establishing a maintenance program—as well as any obstacles the Coast Guard faces to field the transferred aircraft, and (2) to what extent the acquisition will affect the overall cost and performance of the Coast Guard’s fixed wing aviation fleet.

To determine the status of the transfer of the C-27Js from the Air Force to the Coast Guard, including cost and schedule estimates, plans for testing, and establishing a maintenance program—as well as any obstacles the Coast Guard faces to field the aircraft, we examined the Coast Guard’s C-27J Implementation Plan as well as other key acquisition documents, including life cycle cost estimates, acquisition program baselines, and logistics studies. To develop a list of major steps in the transfer process, we analyzed the Coast Guard’s initial C-27J Implementation Plan and compared the steps in this plan to the Coast Guard’s Major Systems Acquisition Manual as well as the most recent C-27J Acquisition Decision Memorandum to identify what needed to be done and when. To gain a better sense of the history of the aircraft and its past performance and issues, we reviewed program documents on costs, and maintenance history from both the Air Force and Army. We spoke to members of the Air Force’s C-27J program office to identify how much knowledge the Air Force gained through its acquisition process and gain an understanding of the successes and challenges that they were having. We also reviewed interagency contracting agreements the Coast Guard has with the Army and Navy as well as C-27J contract documents. We interviewed Coast Guard officials from the requirements and acquisitions directorates to identify challenges for the transfer and sustainment of the aircraft, as well as officials from the Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance Project regarding the acquisition and implementation of the mission system.

We developed a list of risk areas based on Coast Guard documentation and what is needed to develop sufficient knowledge about the program. We interviewed U.S. Naval Air Systems Command officials on airworthiness standards as well as the mission system in development by the Navy. We visited the Air Force 309th Aerospace Maintenance and Regeneration Group (AMARG), located on Davis-Monthan Air Force Base, to view the 13 C-27Js in storage and interview Air Force officials in charge of the C-27Js on site, as well as collect flight and maintenance logs regarding past C-27J operation. We met with U.S. Army Special Operations Command officials at Fort Bragg, interviewed contracted

logistics support for the C-27J, and toured the parts warehouse and viewed some of the C-27Js on site. We also interviewed program office officials and contractor representatives from the Coast Guard's C-27J Asset Project Office to gain a better sense of operational challenges and how they are being addressed and toured their respective facilities to discuss issues related to the fielding of the aircraft. We visited L-3 Communications in Waco, Texas to discuss the progress of the 14<sup>th</sup> plane, view the plane in its current condition, and interview Defense Contract Management Agency officials.

To assess the costs of operating and fully equipping the C-27J for Coast Guard missions compared to the program of record, we used the Coast Guard's May 2012 business case for information regarding all of the costs associated with acquiring and operating this asset for the next 30 years—2013 through 2042. This estimate, derived in May 2012 by the Survivability/Vulnerability Information Analysis Center at Wright Patterson Air Force Base in Ohio, used the costs for the HC-144 and the HC-130J to estimate the costs of the C-27J using the relative weights of each aircraft. We also used the same perspective as this analysis, in that we looked at the costs to the Coast Guard over the next 30 years given the options for fleet composition. We assumed—similar to the 2012 business case—that the Coast Guard has to purchase the remaining HC-130Js with acquisition funds even though these aircraft have been added by Congress to the Coast Guard's budget in prior years.

We changed three assumptions underlying the analysis to better reflect the Coast Guard's actual data:

1. **Flight Hours:** The business case assumed that the C-27J and HC-144 would fly 1,200 hours per year but the Coast Guard plans to fly each aircraft for 1,000 hours per year. Our analysis used the 1,000 hour number because it is the actual planned amount.
2. **Designed Service Life:** The Coast Guard's business case assumed that all three of its fixed-wing assets have the same designed service life. However, the HC-144 has a 40-year designed service life, the C-27J has a 25-year designed service life, and the HC-130J is designed for a 30-year life. While the Coast Guard maybe able to extend the service life of the C-27J, it could also do so for the HC-144 and HC-130J. We accounted for this by dividing each asset's full acquisition cost by the designed service life and multiplying by the 30-year span of the analysis.

3. **Spare Parts:** The Coast Guard is not going to receive \$42 million in spare parts from the Air Force, which was factored into the original business case but not our analysis.

We also used the business case to generate purchase and employment schedules for each fixed-wing aircraft for the next 30 years. To assess the Coast Guard's current plan, we received the planned flight hours for the next 10 years from the Coast Guard's planning directorate and, similar to the business case, extrapolated these numbers over the next 30 years.

To convert all information into fiscal year 2015 dollars, we used the deflators for procurement, fuel, operations and maintenance, and military pay as appropriate from the Office of the Under Secretary of Defense's National Budget Estimates for FY 2015, known as the green book.

The efficiency of each planned fleet was derived by taking the total acquisition and operating costs of each planned fleet and dividing this number by the total planned flight hours.

Lastly, we met with Coast Guard officials who put together the Coast Guard's estimate and assessed the estimate from the Survivability/Vulnerability Information Analysis Center. In addition, we met with Coast Guard officials who are working on the Coast Guard's Fleet Mix Analysis who provided schedules and briefings to us describing this ongoing assessment.

# Appendix II: Comments from the Department of Homeland Security



U.S. Department of Homeland Security  
Washington, DC 20528

**Homeland  
Security**

March 10, 2015

Michele Mackin  
Director, Acquisition and Sourcing Management  
U.S. Government Accountability Office  
441 G Street, NW  
Washington, DC 20548

Re: Draft Report GAO-15-325, "COAST GUARD AIRCRAFT: "Transfer of Fixed-Wing C-27J Aircraft is Complex and Further Fleet Purchases Should Coincide with Study Results"

Dear Ms. Mackin:

Thank you for the opportunity to review and comment on this draft report. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO) work in planning and conducting its review and issuing this report.

The C-27 aircraft transfer fulfilled the Medium Range Surveillance program of record and will improve Coast Guard capability and mission performance while avoiding \$500 million in acquisition costs. The Coast Guard disagrees with the report's analysis of cost and flight hours of the 2007 Program of Record, 2013 Letter to Congress, and the current fixed-wing aircraft plan. The original analysis, which formed the basis for the 2007 and 2013 documents, was conducted by a reputable third party entity. The analysis contained in this report updated some assumptions but did not carry those assumptions throughout the entire report.

The draft report contained two recommendations directed to the DHS. Specifically, GAO recommended that the:

**Recommendation 1:** Secretary of Homeland Security and the Commandant of the Coast Guard inform Congress of the timeframes and key milestones for completing the fleet mix study, including the specific date when the Coast Guard will publish its revised annual flight hour needs and when it plans to inform Congress of the corresponding changes to the composition of its fixed-wing fleet to meet these needs.

**Response:** Concur. The Coast Guard will concurrently develop the USCG Mission Needs Statement (MNS), various Concept of Operations (CONOPs), as well as complete an upgrade to Coast Guard Maritime Operational Effectiveness Simulation (CGMOES). Upon completion, estimated September 30, 2016, of the USCG MNS, various CONOPs, and CGMOES upgrade, the Coast Guard will conduct a Fleet Mix Study and Analysis to produce a revised Program of Record (POR).

A revised statement of annual flight hour needs will be provided following the approval of a new POR. Upon approval of a new POR the Coast Guard will inform Congress of the corresponding changes to the composition of its fixed-wing fleet to meet its flight hour needs. Estimated Completion Date: To Be Determined

**Recommendation 2:** Commandant of the Coast Guard advise Congress to modify the provision of any additional HC-130Js, as appropriate, pending the findings of the fleet mix study.

**Response:** Non-Concur. The President's Budget provides the prioritized funding request for Coast Guard aircraft on an annual basis to Congress. It would not be appropriate for the Coast Guard to provide any additional guidance to Congress on how to appropriate funds. We request that GAO consider this recommendation resolved and closed.

Again, thank you for the opportunity to review and comment on this draft report. Technical comments were previously provided under separate cover. Please feel free to contact me if you have any questions. We look forward to working with you in the future.

Sincerely,



Jim H. Crumacker, CIA, CFE  
Director  
Departmental GAO-OIG Liaison Office

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# Appendix III: GAO Contact and Staff Acknowledgments

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## GAO Contact

Michele Mackin, (202) 512-4841 or [mackinm@gao.gov](mailto:mackinm@gao.gov)

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## Staff Acknowledgments

In addition to the contact above, Katherine Trimble, Assistant Director; Laurier R. Fish; Marie Ahearn; Peter W. Anderson; Ozzy Trevino; and Melissa Wohlgemuth all made key contributions to this report. Jonathan Mulcare also made contributions to this report.

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# Related GAO Products

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*Coast Guard Acquisitions: Better Information on Performance and Funding Needed to Address Shortfalls.* [GAO-14-450](#). Washington, D.C.: June 5, 2014.

*Coast Guard: Portfolio Management Approach Needed to Improve Major Acquisition Outcomes.* [GAO-12-918](#). Washington, D.C.: September 20, 2012.

*Observations on the Coast Guard's and the Department of Homeland Security's Fleet Studies.* [GAO-12-751R](#). Washington, D.C.: May 31, 2012.

*Coast Guard: Action Needed as Approved Deepwater Program Remains Unachievable.* [GAO-11-743](#). Washington, D.C.: July 28, 2011.

*Coast Guard: Deepwater Requirements, Quantities, and Cost Require Revalidation to Reflect Knowledge Gained.* [GAO-10-790](#). Washington, D.C.: July 27, 2010.



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